

# Considered Judgement Form

*Meeting date: 14 November 2007*

*Topic: Hip Arthroscopy Update*

## **Background and Purpose:**

Hip arthroscopy is a technically difficult keyhole surgery of the hip used for diagnosing and treating hip pain. Entry to the hip is made by applying traction to the joint and making small incisions in two to three locations through which instruments are inserted. The procedure was used minimally in the 1980's, but it brought awareness to many pathologies of the labrum, chondral surfaces and other tissues of the hip joint that were previously unrecognised and therefore untreated. It is now used with increasing frequency and rapid improvements in technique were seen by the late 1990s and early 2000s. Hip arthroscopy is now more often used therapeutically than diagnostically, and has been used in hospitals overseas for the treatment of labral tears, chondral lesions, ligamentum teres ruptures, septic arthritis, femoroacetabular impingement (FAI), osteoarthritis, pathologies in hips with acetabular dysplasia, and for the removal of loose bodies.

ACC completed a review of Hip Arthroscopy in 2003. The conclusions of the 2003 report were that there was reasonable evidence to justify the use of hip arthroscopy for both diagnostic and therapeutic applications in carefully selected circumstances. Patient selection criteria were set out as listed below and hip arthroscopy has been purchased by ACC on a case by case basis.

- Hip pain is most likely attributable to an injury
- Except in the case of sepsis, hip pain has lasted more than 6 months during which time it has been unresponsive to conservative treatment
- In most cases the patient has not received a previous operative treatment for the hip involved
- The patient is less than 55 years of age
- Osteoarthritis is not detectable by radiological techniques
- The intervention is proposed for –
  - The removal of loose bodies
  - The detection and treatment of labral tears, tears to the ligamentum teres, chondral damage, or synovitis
  - Acute sepsis where the diagnosis has been made early and the organism is sensitive to antibiotic treatment.

Since the 2003 review the number of requests to ACC for hip arthroscopy has increased each year, including a significant proportion for older patients. The EBH group was asked by ACC management to carry out an updated evidence-based review to determine whether there have been any changes in the efficacy of hip arthroscopy, the indications for hip arthroscopy, and whether the diagnostic alternatives for intra-articular hip pain have changed or improved. The diagnostic alternatives to hip arthroscopy reported in the literature were primarily intra-articular injection of anesthetic, diagnostic manoeuvres of the hip, magnetic resonance imaging (MRI) and magnetic resonance arthroplasty (MRA).

The 2007 updated evidence-based review of hip arthroscopy considered medical literature published since 2002.

## 1. Effectiveness, Volume of Evidence, Applicability /Generalisability and Consistency

### Therapeutic Hip Arthroscopy

The quality of evidence supporting hip arthroscopy is poor and has not improved since the 2003 EBH review except with regard to the way outcomes are measured. A numerical scoring system was used in 70% of the reports, with the Modified Harris Hip Score (MHHS) being used most predominantly. There are no RCT's and still no comparisons of outcomes with other therapeutic interventions. Any conclusions about the therapeutic effectiveness and indications for hip arthroscopy are still dependent on case series (24 in total). The number of patients ranged from 6 to 101, except for two complications studies which both had >1000 patients. The follow-up periods ranged from 1 year to 8 years, and the most common period was 2 years. The age of patients ranged from 5 to 64, and six studies included patients aged over 55 yrs.

**Loose Bodies:** It is widely accepted in the literature pre- and post-2002 that the most effective application of hip arthroscopy is the removal of loose bodies. Since 2002, only two case-series about loose body removal have been published (n = 11 and 36) and they related to treatment after a traumatic hip dislocation. Both studies included only those cases that did not require open surgical management for the dislocation themselves. Only one study (n=11), reported clinical outcomes, which were described as good or excellent based on pain, limp, hip motion and radiographic findings. (Surgeons did not wait the standard 6 months before operating, and instead recommended waiting at least 3 weeks for the capsule to heal before performing arthroscopy).

**Ligamentum teres.** One case study reported on the treatment of ruptured ligamentum teres (n=23). The average MHHS shifted from 47 to 90/100, and 96% of patients had a >20 point score improvement. Ruptures of ligamentum teres occur rarely (8% of hip arthroscopy patients) and are very difficult to diagnose pre-surgery (0% by MRI, 9% by MRA).

**Labral tear:** There were eight case series, consistently reporting good outcomes after labral tear debridement. Five of these used a numerical scoring system; four of which showed a score improvement of >20 points, and one reported 68% patients had good or excellent results according to the MHHS system. The number of patients ranged from 10 to 66. The remaining three studies were of particularly poor quality but described good outcomes for elite athletes (n = 8, 6, and 10).

Two of the labral tear studies looked at outcomes in patients (n=48, and 10) who had developmental dysplasia. Both studies reported good results (Study 1: average MHHS score improvement of 27 points; 79% showed at least a 10 point improvement. Study 2: MHHS shifted from 64.5 to 92.5/100 after 8 years; but three patients had pain symptoms after prolonged exercise)

**Septic arthritis:** There was one case series about septic arthritis (n=10). All patients had excellent results, having a MHHS of 97.9/100 at final mean follow up period of 4 yrs 11 months.

**Osteoarthritis.** Two case series reported poor outcomes in patients with severe osteoarthritis, results that are consistent with findings in the 2003 review. (Study 1: n=39, 72% had poor clinical result; Study 2: n=9, median MHHS improved by 4 points). There were examples throughout the other case series illustrating that poor outcomes are achieved in the treatment of other pathologies when there is co-existing degradation of chondral tissue.

**Femoroacetabular impingement:** A new therapeutic application for hip arthroscopy, reported since the 2003 EBH review, is the arthroscopic treatment of femoroacetabular impingement (FAI). FAI is an anatomic deformity that predisposes patients to labral tears and chondral lesions. Early results were reported in brief paragraphs within review or technical papers, and suggested that FAI can be resolved arthroscopically, but there are associated complications and it is too early to conclude that this approach is effective.

**Treatment of children:** One case series reported on children and adolescents (n=42) with a variety of hip disorders. Overall MHHS shifted from 53.1 to 82.9/100. Follow-up 17 months.

**Treatment of older patients (>55 years):** The generally held view of review authors, and one case series author who analysed outcomes with age, is that older age *per se* no longer seems to be a contra-indication for hip arthroscopy. Of more relevance is the condition of the articular chondral surfaces and the diagnosis of hip

pathology.

**Complications:** The complications associated with hip arthroscopy are well documented and include both transient complications (transient neuropraxia, vaginal tear, trochanteric bursitis, excessive portal bleeding, portal hematomas, instrument breakage, infection, arthrotomy, intra-abdominal fluid extravasations), and serious longer term complications (scuffing of femoral head, avascular necrosis of femoral head, femoral neck fracture). In general there are fewer complications now that techniques and equipment are optimized. Experienced surgeons stress the critical importance of a thorough patient history and clinical assessment in guiding patient selection to minimise complications. Complication rates of very experienced surgeons from operations on >1000 patients are low (0.5% serious, 1.4-3.8% transient). Less experienced surgeons report transient complication rates ranging from 7-16%.

#### Diagnostic Hip arthroscopy

There were no recent studies that specifically set out to assess the role for diagnostic arthroscopy. However, many of the patients in the studies mentioned above received hip arthroscopy for as yet undiagnosed hip pathology. There is controversy over the use of hip arthroscopy purely for diagnostic purposes, but it is generally accepted in review literature that diagnostic hip arthroscopy should be considered for pain persisting for 6 months or more because the operation can easily be modified to become a therapeutic procedure.

#### Alternative diagnostic tools for intra-articular hip pain

The quality of evidence comparing the use of these tools to diagnose intra-articular hip pathology is poor. There are no RCT's and the 10 studies reviewed were case series. Most studies had 25 or more patients.

Intra-articular injection of anesthetic and manoeuvres of the hip joint are useful in confirming the presence of an intra-articular pathology, but neither of these approaches can differentiate between the numerous pathologies that cause hip pain. Imaging techniques provide the only non-surgical means of making a specific diagnosis, but these techniques do not provide an entirely sensitive or specific diagnosis of hip pathology.

MRI (1.5-T) commonly generates a high number of false negative readings (42%). However, better accuracy has been demonstrated by some individuals using certain protocols [e.g. 3.0-T MRI (n=8, 100% accurate), or optimized 1.5-T MRI protocols (n=92, 95% accurate)]. MRA imaging was generally superior to MRI in evaluating intra-articular hip pathology but there was a large variation in sensitivity (24 to 100%) and accuracy rates (68 to 94%) between the five studies evaluated in this EBH review.

One study used bone scintigraphy to diagnose labral tears on the basis of a distinctive focal uptake pattern appearing in patients (n=27) who had labral tears. This study challenges the current opinion that bone scans can not diagnose labral tears.

## 2. Cost

Most hip arthroscopy claims involve MRI and/or arthrogram imaging, in addition to the hip arthroscopy procedure. The **mean costs per claim** for these procedures are:

Hip arthroscopy: ~\$6,400 in 2006; (compared with ~\$5,000 in 2002)

MRI/Arthrogram: ~\$1,400 in 2006; (compared with ~\$1,400 in 2002)

Based on data (which had limitations) from ACC's Business Intelligence group, ACC purchased 88 hip arthroscopies in 2006, and the projection for 2007 was that 90-100 patients would have the procedure. This compares with 3 hip arthroscopies purchased in 2002.

### 3. Clinical impact

Hip arthroscopy remains a technically difficult procedure with a very steep learning curve. [One external peer reviewer, a hip arthroscopy surgeon, endorses the generalised non-scientific statement that a surgeon needs at least 100 cases to be proficient.] The use of therapeutic hip arthroscopy requires strict adherence to patient selection criteria, and it is critically important to obtain a thorough patient history and carry out a thorough clinical assessment to guide patient selection.

The older patient should be selected with care. It has been stated in a previous section that “older age *per se* no longer seems to be a contra-indication for hip arthroscopy. Of more relevance is the condition of the articular chondral surfaces and the diagnosis of hip pathology”. However, the caveat to this is that older patients are more likely to have chondral degradation and there is variability of the degree to which the condition of the articular chondral surfaces is consistently and reliably identified using existing imaging tools (MRI, MRA).

The alternatives to hip arthroscopy are open surgery or non-operative treatment. Hip arthroscopy for the carefully selected patient is less invasive than open surgery techniques. Consequently the hospitalisation and recovery periods are shorter. For patients who would otherwise receive non-operative treatment, hip arthroscopy for the carefully selected patient offers a chance to correct a pathology that would likely result in persistent symptoms and possibly lead to the progression of osteoarthritis.

### 4. Equity, Maori Health, Pacific Health, Acceptability

There are five orthopaedic surgeons currently performing the hip arthroscopy procedure in New Zealand, two in Auckland and Christchurch and one in Wellington, and so any general access issues relate to proximity to a specialist.

One contra-indication for hip arthroscopy is severe obesity, which is a condition that occurs with greater prevalence in Maori and Pacific Island populations.

### 5. Possible Purchasing Options

Purchase, non-purchase, or continue to purchase on a case by case basis.

### 6. Evidence Statement

There is moderate evidence from case series reports to justify the continued use of diagnostic and therapeutic applications in carefully selected circumstances for:

- Removal of loose bodies
- Detection and treatment of labral tears, rupture of the ligamentum teres, (or synovitis, according to ACC's 2003 review).
- Treatment of acute sepsis where the diagnosis has been made early and the organism is sensitive to antibiotic treatment.

(Note: The 2003 report recommended the use of hip arthroscopy for treatment of chondral damage. This is not supported by the new evidence and so chondral damage has been removed from the list of indications).

There is moderate evidence from case series studies and evidence from a range of review articles that isolated labral tears are rare and that the majority of labral tears are associated with FAI, capsular laxity, degenerative changes and dysplasia.

There is low quality evidence from a range of review articles indicating that good outcomes are directly correlated with less severe grades of cartilage lesions.

There is moderate evidence from case series reports that the outcomes from hip arthroscopy are poor when the patient has osteoarthritis, and/or severe acetabular chondral damage (grade IV lesions using the Outerbridge classification system).

Evidence from expert opinion in a range of review articles suggests that the other contra-indications for hip arthroscopy are joint ankylosis, superficial infection, severe obesity, stable non-progressing avascular necrosis.

There is low quality evidence from a single case series to suggest that age *per se* may not be a contra-indication to hip arthroscopy.

There is moderate evidence from case series reports that fewer complications occur when the procedure is carried out by experienced surgeons.

## 7. Purchasing Recommendations

Continue to purchase hip arthroscopy on a case by case basis according to ACC's Clinical Protocol for Hip Arthroscopy.

ACC's Clinical Protocol should include the following selection criteria:

- Hip pain is most likely attributable to an injury, and not to an anatomic deformity such as FAI
- Hip pain has persisted for more than 6 months and has been unresponsive to conservative treatment (except in the case of sepsis, or for removal of loose bodies resulting from traumatic hip dislocation)
- In most cases the patient has not received previous operative treatment for the hip involved
- Patients >55 years are not necessarily contra-indicated, however it is particularly important to use highest resolution imaging techniques to determine the condition of chondral surfaces.
- Osteoarthritis, and other moderate to severe chondral damage, is not detectable by radiological techniques
- Patient has none of the other contra-indications for hip arthroscopy (joint ankylosis, superficial infection, severe obesity, stable non-progressing avascular necrosis).

ACC should purchase hip arthroscopy from surgeons who have had appropriate training and experience in hip arthroscopy as defined by the New Zealand Orthopaedic Association (NZOA).

ACC should invite the NZOA to provide ACC with outcome data (e.g. MHHS and possibly others) from hip arthroscopy operations.

### PGAG Discussions:

The group agreed that ACC should engage with the NZOA regarding two issues:

1. To establish what the NZOA consider is appropriate training and experience for hip arthroscopy.
2. To invite the NZOA to contribute to the evidence base for hip arthroscopy by providing ACC with outcome data (e.g. MHHS and possibly others) from hip arthroscopy operations.